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10/802,984	03/17/2004	Donald R. Van Der Moere	D5270	3898

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P.O. BOX 1488  
WARRENVILLE, IL 60555

EXAMINER
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GARCIA, ERNESTO

ART UNIT	PAPER NUMBER
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3679

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06/21/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/802,984  
Filing Date: March 17, 2004  
Appellant(s): VAN DER MOERE ET AL.

**MAILED**

JUN 21 2007

**GROUP 3600**

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Elias P. Soupos  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed February 27, 2007 appealing from the Office action mailed July 27, 2006.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**WITHDRAWN REJECTIONS**

The following ground of rejection is not presented for review on appeal because it has been withdrawn by the examiner. The rejection of claims 8 and 10-14 under 35 U.S.C. 112, second paragraph has been withdrawn.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

5,851,659	KOMURO et al.	12-1998
1,491,155	McKONE	4-1924
4,406,558	KOCHENDORFER et al.	9-1983
5,601,293	FUKUTOME et al.	2-1997
3,757,378	WAKEFIELD	9-1973

**(9) Grounds of Rejection**

The following grounds of rejection are applicable to the appealed claims:

***Claim Rejections - 35 USC § 102***

Claims 1, 3, 4, 6, and 7, as best understood, are rejected under 35 U.S.C. 102(b) as being anticipated by Komuro et al., 5,851,659.

Regarding claim 1, Komuro et al. disclose, in Figure 3, a piston pin comprising a piston pin exterior margin 13 coated with a chromium-nitride (Cr-N) coating (col. 7, lines 47-50). Appellants should note that the exterior margin is able to shiftably mate with an inside margin of a pin bore of an appropriately sized connecting rod without employing an intervening bushing.

Regarding claim 3, appellants are reminded that it is the patentability of the product, not recited process steps, that is to be determined irrespective of whether only process steps are recited. Accordingly, how the Cr-N coating is deposited, e.g., by

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physical vapor deposition, is of little consequence when Komuro et al. possess such coating. Therefore, this limitation has been given limited patentable weight. See MPEP 2113.

Regarding claim 4, the chromium-nitride coating was deposited to a depth of between 1 and 10 microns (col. 2, line 40).

Regarding claim 6, the coating is buffed. Appellants should note that the roller fatigue test apparatus inherently buffs the material until the coating peels off.

Regarding claim 7, the coating is buffed. Appellants are reminded that it is the patentability of the product, not recited process steps, that is to be determined irrespective of whether process steps are recited. Accordingly, how the coating is buffed, e.g., in a centerless buffing operation, is of little consequence when Komuro et al. possess such buffed coating. Therefore, this limitation has been given limited patentable weight. See MPEP 2113.

### ***Claim Rejections - 35 USC § 103***

Claim 5 is rejected under 35 U.S.C. 103(b) as being anticipated by Komuro et al., 5,851,659.

Regarding claim 5, Komuro et al. disclose the chromium-nitride coating deposited to a depth of a range of 1-80 microns (co. 2, line 40). However, Komuro et al. do not disclose "substantially 5 microns". Appellants should note, that in a design consideration, one skilled in the art will choose a depth of 5 microns thus reading on "substantially 5 microns". Therefore, as taught by Komuro et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to choose a depth of substantially 5 microns as part of a design consideration.

Claims 8, 10, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over McKone, 1,491,155, in view of Kochendorfer et al., 4,406,558.

Regarding claim 8, McKone discloses, in Figure 6, a combination of a piston pin **17** and a connecting rod **18**. The piston pin **17** has a piston pin exterior margin. The pin bore and the piston pin are mating. The mating is a shiftable surface-to-surface engagement without employing an intervening bushing. Note that Figure 1 in McKone uses a bushing and Figure 6 does not use a bushing.

However, McKone fails to disclose the exterior margin having a coating being comprised of chromium-nitride. Kochendorfer et al. teach coating the exterior margin of a piston pin with a hard nitride of the metals in the third to sixth group of the periodic table (see attachment) to produce a sliding bearing layer (col. 2, lines 45-50). Appellants should note that Chromium (Cr) is in the sixth group of the periodic table (see

attachment) and a hard nitride of the sixth group renders chromium-nitride, which falls within the scope of the description to make a layer. Therefore, as taught by Kochendorfer et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the piston pin of McKone with a coating of chromium-nitride to provide a sliding bearing layer. Given the modification, the coating will be a chromium-nitride coating disposed on the tubular body.

Regarding claim 10, appellants are reminded that it is the patentability of the product, not recited process steps, that is to be determined irrespective of whether only process steps are recited. Accordingly, how the Cr-N coating is deposited, e.g., by physical vapor deposition, is of little consequence when McKone as modified by Kochendorfer et al. possesses such coating. Therefore, this limitation has been given limited patentable weight. See MPEP 2113.

Regarding claim 15, McKone discloses, in Figure 6, a method comprising:  
forming a piston pin body **17** having an exterior margin;  
forming an inside surface margin of a connecting rod **18** of a certain material, including the surface of a pin bore; and,  
mating the exterior margin of the tubular body **17** with the inside surface margin of the pin bore in a shiftable inside surface-to-surface engagement without employing an intervening bushing. However, McKone fails to coat the exterior margin with a chromium-nitride material.

Kochendorfer et al. teach coating the exterior margin of a piston pin with a hard nitride of the metals in the third to six group of the periodic table to produce a sliding bearing layer (col. 2, lines 45-50). Appellants should note that Chromium (Cr) is in the sixth group of the periodic table and chromium-nitride falls within the description as a layer. Therefore, as taught by Kochendorfer et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the exterior margin of McKone with a coating of chromium-nitride to provide a sliding bearing layer.

Claims 10-12 and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over McKone, 1,491,155, in view of Kochendorfer et al., 4,406,558, as applied to claims 8-10, 15, and 16, and further in view of Komuro et al., 5,851,659.

Regarding claims 10 and 17, McKone as modified by Kochendorfer et al., fail to deposit the chromium-nitride coating by physical vapor deposition. Komuro et al. teach depositing chromium-nitride coating through physical vapor deposition as an ion plating process to provide resistance to peeling, abrasion and baking (see Abstract). Therefore, as taught by Komuro et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to deposit the chromium-nitride coating by physical vapor deposition to provide resistance to peeling, abrasion, and baking.

Regarding claims 11 and 18, McKone as modified by Kochendorfer et al., fail to disclose to deposit the chromium-nitride coating to a depth of between 1 and 10 microns. Komuro et al. teach a chromium-nitride coating deposited to a depth of between 1 and 80 microns (col. 2, line 40) as part of a design consideration of a sliding surface. The range of 1 and 10 microns falls within this disclosed range. Therefore, as taught by Komuro et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to deposit the chromium-nitride coating to a depth of between 1 and 10 microns as determined through routine experimentation and optimization.

Regarding claims 12 and 19, McKone, as modified by Kochendorfer et al. and Komuro et al., disclose the chromium-nitride coating deposited to a depth of a range of 1-80 microns (co. 2, line 40). However, Komuro et al. does not disclose "substantially 5 microns". Appellants should note, that in a design consideration, one skilled in the art will choose a depth of 5 microns thus reading on "substantially 5 microns". Therefore, as taught by Komuro et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to choose a depth of substantially 5 microns as part of a design consideration.

Claims 13 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over McKone, 1,491,155, in view of Kochendorfer et al., 4,406,558, and Komuro et al.,

5,851,659, as applied to claims 10-12 and 17-19, and further in view of Fukutome et al., 5,601,293.

Regarding claims 13 and 20, McKone, as modified above, fails to disclose buffing the chromium-nitride after deposition. Fukutome et al. suggest treating surface roughness by buff-polishing a surface to resist wear (col. 7, line 18-21). Further, one skilled in the art knows that polishing reduces surface roughness in moving parts, as taught by Fukutome et al.. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to buff the chromium-nitride after deposition to treat the surface roughness to resist wear.

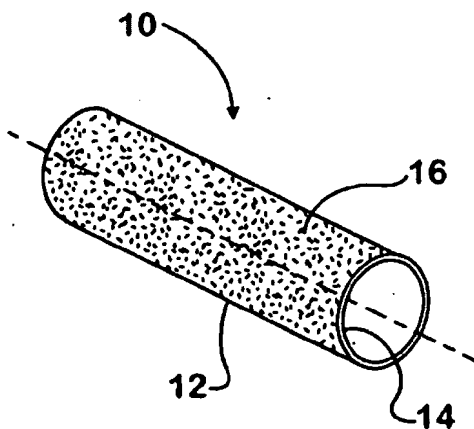
Claims 14 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over McKone, 1,491,155, in view of Kochendorfer et al., 4,406,558, Komuro et al., 5,851,659, and Fukutome et al., 5,601,293, as applied to claims 13 and 20 above, and further in view of Wakefield, 3,757,378.

Regarding claim 21, as modified above, Fukutome et al. fail to disclose the buffing operation used. Wakefield teaches a centerless buffing operation to polish components. Therefore, as taught by Wakefield, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a centerless buffing operation to buff the coating of chromium-nitride.

**(10) Response to Argument**

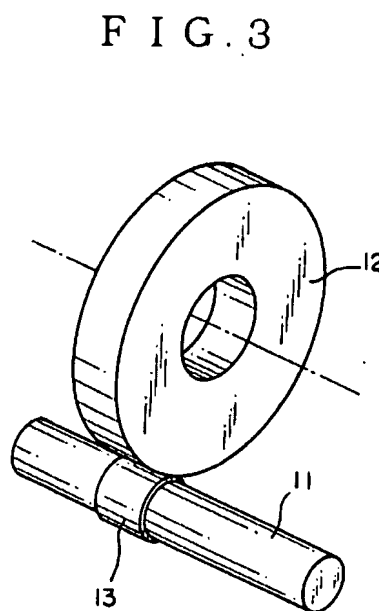
Claims 1, 3, 4, 6, and 7

Appellants argue that feature 13 of Komuro et al. is not a piston "that is shiftably matable with an inside margin on a pin bore of a connecting rod without the employment of an intervening bushing. In response, it should be noted that this limitation does not impart any structure but rather recites the intended purpose of the coating. Accordingly, the same coating being recited is capable of performing as claimed. There's nothing in the piston pin of Komuro et al. that would prevent such function. Appellants further argue that feature 13 is a test piece attached to a test roller and is not considered a piston pin. The examiner disagrees since claim 1 is directed to the pin 10 as shown in appellants' Figure 4, which is similar to feature 13 shown in Komuro et al.



**FIG. 4**

Appellant's invention.



Komuro et al. showing the pin on a roller.

Appellants further argue that Komuro does not imply a piston pin or any similar structure. In response, the appellant have not pointed out from the claims what structural features of the so-called "piston pin" does Komuro et al. fail to meet. Note that both figures shown above show a cylindrical tube and both have a coating of chromium-nitride thus the so the tester 13 is a piston pin as claimed.

#### Claim 5

Appellants argue that since Komuro et al. do not teach independent claim 1, then the teachings of Komuro et al. do not anticipate nor make obvious the claimed combination of claim 5 since the teachings do not yield a piston pin. The examiner disagrees and directs the Board to the arguments previously made against claim 1.

#### Claims 8, 10, and 15

Appellants argue that McKone teaches in Figure 1 a connecting rod "provided with a semi-spherical bearing fitting over the bearing 5" and thus does not teach "without the employment of an intervening bushing". In response, it should be noted that the examiner is not relying on Figure 1 but rather Figure 6, which clearly does not show any intervening bushing. McKone's Figure 6 clearly discloses "a piston pin and a connecting rod combination that provides for a shiftably matable engagement without the employment of an intervening bushing". Accordingly, the remaining arguments made against Figure 1 of McKone are moot.

Appellants then argue that Kochendorfer generally point to a genus group of metals suitable for use in his coating layer that includes numerous elements specifically,

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coating including metals belonging within the third, fourth, fifth, or sixth groups in the periodic table of elements, and does not specifically teach use of Chromium". In response, the fact that Kochendorfer does not specifically describes all the metals belonging in the groups stated above does not obviate that Chromium, which is element 24 in the periodic table, is a metal which falls in the sixth group. One skilled in the art referencing the periodic table will see that Chromium is a metal in the sixth group.

Appellants further argue that the examiner has failed to provide a prima facie case of obviousness. The examiner disagrees since Kochendorfer et al. provide a clearly motivation for using a chromium-nitride as sliding bearing layer in a pin (see column 2, lines 45-50).

Claims 10-12 and 17-19

Appellants argue that "the combination of McKone and Kochendorfer et al. does not yield a piston pin and connecting rod combination that provides for a shiftably matable engagement without the employment of an intervening bushing". In response, the examiner directs the Board to the arguments presented to claims 8 and 15 since the examiner relies on Figure 6 and not Figure 1. Appellants further argue that the examiner has failed to point to any suggestion or motivation to coat the bearing of McKone or the gudgeon pins of Kochendorfer et al. with the chromium-nitride coating taught by Komuro. In response, it should be noted that Komuro et al. is not used to teach chromium-nitride coating since Kochendorfer et al teach this coating. Komuro et

al. is used to merely teach how one skilled in the art deposits chromium-nitride by vapor deposition.

Claims 13 and 20

Appellants argue that Fukutome et al. teach that the lower test piece, not the coated piece is buff-polished to yield a uniform roughness. The examiner has noted the argument and does not disagree; however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to buff both moving parts to reduce friction between the parts. Therefore, it would have been obvious to buff the moving parts so that it will create less friction as compared to none buffed surfaces, in particular, after depositing the chromium-nitride in both parts or in just one part.

Claims 14 and 21

Appellants argue that the combination of McKone in view of Kochendorfer, Komuro, and Fukutome fails to teach or imply the limitation in the claimed combination. The examiner directs the Board to review the examiner's arguments against claims 13, 14, 20, and 21 since there is no concrete argument as to why Wakefield does not render the claims obvious.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Ernesto Garcia

A handwritten signature in black ink, appearing to read "Ernesto Garcia", written over the printed name.

Conferees:

Daniel P. Stodola

DPS

A large, stylized handwritten signature of Daniel P. Stodola in black ink.

Meredith C. Petravick

MP

DANIEL P. STODOLA  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3500

Attachment: one page showing the periodic table.

# Periodic Table of the Elements

Hydrogen  
Semiconductors  
(also known as metalloids)

Metals  
Alkali metals  
Alkaline-earth metals  
Transition metals  
Other metals  
Nonmetals  
Halogens  
Noble gases  
Other nonmetals

Atomic Number  
Symbol  
Name  
Average Atomic Mass

1  
H  
Hydrogen  
1.007 94

2  
Li  
Lithium  
6.941

3  
Na  
Sodium  
22.989 769 28

4  
K  
Potassium  
39.0983

5  
Rb  
Rubidium  
85.4678

6  
Cs  
Cesium  
132.905 4519

7  
Fr  
Francium  
(223)

Group 1  
Be  
Beryllium  
9.007 187

Group 2  
Mg  
Magnesium  
24.305 0

Group 3  
Ca  
Calcium  
40.078

Group 4  
Sc  
Scandium  
44.955 912

Group 5  
Ti  
Titanium  
47.867

Group 6  
V  
Vanadium  
50.9415

Group 7  
Cr  
Chromium  
51.9961

Group 8  
Mn  
Manganese  
54.938 045

Group 9  
Fe  
Iron  
55.845

Group 10  
Co  
Cobalt  
58.933 195

Group 11  
Ni  
Nickel  
58.6934

Group 12  
Cu  
Copper  
63.546

Group 13  
Zn  
Zinc  
65.409

Group 14  
Ga  
Gallium  
69.723

Group 15  
Ge  
Germanium  
72.64

Group 16  
As  
Arsenic  
74.921 60

Group 17  
Se  
Selenium  
78.96

Group 18  
Br  
Bromine  
79.904

Group 19  
Kr  
Krypton  
83.798

Group 20  
Xe  
Xenon  
131.293

Group 21  
Rn  
Radon  
(222)

Group 22  
Ra  
Radium  
(226)

Group 23  
Ac  
Actinium  
(227)

Group 24  
Th  
Thorium  
232.038 06

Group 25  
Pa  
Protactinium  
231.036 88

Group 26  
U  
Uranium  
238.028 91

Group 27  
Np  
Neptunium  
(237)

Group 28  
Pu  
Plutonium  
(244)

Group 29  
Am  
Americium  
(243)

Group 30  
Cm  
Curium  
(247)

Group 31  
Bk  
Berkelium  
(247)

Group 32  
Cf  
Californium  
(251)

Group 33  
Es  
Einsteinium  
(252)

Group 34  
Fm  
Fermium  
(257)

Group 35  
Md  
Mendelevium  
(258)

Group 36  
No  
Nobelium  
(259)

Group 37  
Lr  
Lawrencium  
(262)

Group 38  
Lu  
Lutetium  
174.967

Group 39  
Yb  
Ytterbium  
173.04

Group 40  
Tm  
Thulium  
168.934 21

Group 41  
Er  
Erbium  
167.259

Group 42  
Ho  
Holmium  
164.930 32

Group 43  
Dy  
Dysprosium  
162.500

Group 44  
Tb  
Terbium  
158.925 35

Group 45  
Gd  
Gadolinium  
157.25

Group 46  
Eu  
Europium  
151.964

Group 47  
Sm  
Samarium  
150.36

Group 48  
Pm  
Promethium  
(145)

Group 49  
Nd  
Neodymium  
144.242

Group 50  
Pr  
Praseodymium  
140.907 65

Group 51  
Ce  
Cerium  
140.116

Group 52  
Th  
Thorium  
232.038 06

Group 53  
Pa  
Protactinium  
231.036 88

Group 54  
U  
Uranium  
238.028 91

Group 55  
Np  
Neptunium  
(237)

Group 56  
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Group 57  
Am  
Americium  
(243)

Group 58  
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Curium  
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Berkelium  
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Californium  
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Group 61  
Es  
Einsteinium  
(252)

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Fermium  
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Mendelevium  
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Nobelium  
(259)

Group 65  
Lr  
Lawrencium  
(262)

Group 66  
Lu  
Lutetium  
174.967

Group 67  
Yb  
Ytterbium  
173.04

Group 68  
Tm  
Thulium  
168.934 21

Group 69  
Er  
Erbium  
167.259

Group 70  
Ho  
Holmium  
164.930 32

Group 71  
Dy  
Dysprosium  
162.500

Group 72  
Tb  
Terbium  
158.925 35

Group 73  
Gd  
Gadolinium  
157.25

Group 74  
Eu  
Europium  
151.964

Group 75  
Sm  
Samarium  
150.36

Group 76  
Pm  
Promethium  
(145)

Group 77  
Nd  
Neodymium  
144.242

Group 78  
Pr  
Praseodymium  
140.907 65

Group 79  
Ce  
Cerium  
140.116

Group 80  
Th  
Thorium  
232.038 06

Group 81  
Pa  
Protactinium  
231.036 88

Group 82  
U  
Uranium  
238.028 91

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Neptunium  
(237)

Group 84  
Pu  
Plutonium  
(244)

Group 85  
Am  
Americium  
(243)

Group 86  
Cm  
Curium  
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Group 87  
Bk  
Berkelium  
(247)

Group 88  
Cf  
Californium  
(251)

Group 89  
Es  
Einsteinium  
(252)

Group 90  
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Lawrencium  
(262)

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Lu  
Lutetium  
174.967

Group 95  
Yb  
Ytterbium  
173.04

Group 96  
Tm  
Thulium  
168.934 21

Group 97  
Er  
Erbium  
167.259

Group 98  
Ho  
Holmium  
164.930 32

Group 99  
Dy  
Dysprosium  
162.500

Group 100  
Tb  
Terbium  
158.925 35

Group 101  
Gd  
Gadolinium  
157.25

Group 102  
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Europium  
151.964

Group 103  
Sm  
Samarium  
150.36

Group 104  
Pm  
Promethium  
(145)

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Nd  
Neodymium  
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Pr  
Praseodymium  
140.907 65

Group 107  
Ce  
Cerium  
140.116

Group 108  
Th  
Thorium  
232.038 06

Group 109  
Pa  
Protactinium  
231.036 88

Group 110  
U  
Uranium  
238.028 91

Group 111  
Np  
Neptunium  
(237)

Group 112  
Pu  
Plutonium  
(244)

Group 113  
Am  
Americium  
(243)

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Cm  
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Berkelium  
(247)

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Fm  
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Lr  
Lawrencium  
(262)

Group 122  
Lu  
Lutetium  
174.967

Group 123  
Yb  
Ytterbium  
173.04

Group 124  
Tm  
Thulium  
168.934 21

Group 125  
Er  
Erbium  
167.259

Group 126  
Ho  
Holmium  
164.930 32

Group 127  
Dy  
Dysprosium  
162.500

Group 128  
Tb  
Terbium  
158.925 35

Group 129  
Gd  
Gadolinium  
157.25

Group 130  
Eu  
Europium  
151.964

Group 131  
Sm  
Samarium  
150.36

Group 132  
Pm  
Promethium  
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Group 133  
Nd  
Neodymium  
144.242

Group 134  
Pr  
Praseodymium  
140.907 65

Group 135  
Ce  
Cerium  
140.116

Group 136  
Th  
Thorium  
232.038 06

Group 137  
Pa  
Protactinium  
231.036 88

Group 138  
U  
Uranium  
238.028 91

Group 139  
Np  
Neptunium  
(237)

Group 140  
Pu  
Plutonium  
(244)

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Group 145  
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(252)

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Md  
Mendelevium  
(258)

Group 148  
No  
Nobelium  
(259)

Group 149  
Lr  
Lawrencium  
(262)

Group 150  
Lu  
Lutetium  
174.967

Group 151  
Yb  
Ytterbium  
173.04

Group 152  
Tm  
Thulium  
168.934 21

Group 153  
Er  
Erbium  
167.259

Group 154  
Ho  
Holmium  
164.930 32

Group 155  
Dy  
Dysprosium  
162.500

Group 156  
Tb  
Terbium  
158.925 35

Group 157  
Gd  
Gadolinium  
157.25

Group 158  
Eu  
Europium  
151.964

Group 159  
Sm  
Samarium  
150.36

Group 160  
Pm  
Promethium  
(145)

Group 161  
Nd  
Neodymium  
144.242

Group 162  
Pr  
Praseodymium  
140.907 65

Group 163  
Ce  
Cerium  
140.116

Group 164  
Th  
Thorium  
232.038 06

Group 165  
Pa  
Protactinium  
231.036 88

Group 166  
U  
Uranium  
238.028 91

Group 167  
Np  
Neptunium  
(237)

Group 168  
Pu  
Plutonium  
(244)

Group 169  
Am  
Americium  
(243)

Group 170  
Cm  
Curium  
(247)

Group 171  
Bk  
Berkelium  
(247)

Group 172  
Cf  
Californium  
(251)

Group 173  
Es  
Einsteinium  
(252)

Group 174  
Fm  
Fermium  
(257)

Group 175  
Md  
Mendelevium  
(258)

Group 176  
No  
Nobelium  
(259)

Group 177  
Lr  
Lawrencium  
(262)

Group 178  
Lu  
Lutetium  
174.967

Group 179  
Yb  
Ytterbium  
173.04

Group 180  
Tm  
Thulium  
168.934 21

Group 181  
Er  
Erbium  
167.259

Group 182  
Ho  
Holmium  
164.930 32

Group 183  
Dy  
Dysprosium  
162.500

Group 184  
Tb  
Terbium  
158.925 35

Group 185  
Gd  
Gadolinium  
157.25

Group 186  
Eu  
Europium  
151.964

Group 187  
Sm  
Samarium  
150.36

Group 188  
Pm  
Promethium  
(145)

Group 189  
Nd  
Neodymium  
144.242

Group 190  
Pr  
Praseodymium  
140.907 65

Group 191  
Ce  
Cerium  
140.116

Group 192  
Th  
Thorium  
232.038 06